North Philadelphia Peace Park

2226 W. JEFFERSON STREET

Thomas Jefferson University : Retail Division

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Project Summary

North Philadelphia Peace Park is an existing park located at 2226 Jefferson Street in the neighborhood of Sharswood. The site was once trash-filled empty lots, until Tommy Joshua Caison and other local Sharswood residents created Peace Park in 2012 by developing a garden in the shape of a peace sign. Since then, the North Philadelphia Peace Park has been utilized by its local community to expand cultural and horticultural advances to the region through local events. The park is home to a community farm that offers free produce, an Imagination Play-field for children, and they are in the process of building the Sala Nkrumah Community Schoolhouse and Ecology Center, which was designed by University of Pennsylvania's Diverse Design group.This region in Philadelphia is a part of a largely underfunded area that is mostly owned by the local housing authority; Philadelphia Housing Authority. This has led to low local development and an influx of gentrification in the area. PHA has recently made a commitment to allowing Peace Park to not only remain, but expand across the whole block. Peace Park and the local Sharswood area strives to maintain and grow a community-centered space that can provide a home for its cultural, horticultural and educational events.

Our goal is to create a space for its community members through vertically integrated retail farming in order to add to community wealth. The proposed design would include an open-air market, retail space, gardens, and greenhouses to increase food production, as well as a kitchen and recreational and educational spaces. This would allow the project to hold multiple uses for this Integrated Community Supply-Chain Retail Model. This would develop a supply-chain on site from seed, to growing, to processing, to selling and then to eating with

educational guidance on all of those steps. Furthermore, to reduce costs and environmental impact the team has decided to keep all existing buildings on site- but to repurpose them. Maximizing the use of local materials and including murals from the Philadelphia Mural Arts program the design of the structures will increasingly reflect the site's main purpose- to serve the local community. Following our Ten Core Values of Ethical Housing Design - the centralization of small scale communities, urban permaculture, expanding the access of a greener urban landscapes, housing security, aging in place, regenerative architecture techniques, the use of shared spaces, site specific design and multigenerational and multicultural interactions - will help create an new ecological dialogue through community based design of urban agricultural retail.

Project Relevance and Data

This project will serve the local community through repurposing current buildings on site and providing produce to the local Sharswood community which is in a food desert. Based on the team's analysis; the walkability assessment shows lack in markets and/or grocery stores within a one mile radius of the site. This makes it very difficult for residents to have access to fresh produce.The Peace Park will be able to greatly impact its local community and provide a space for community events, gardens and marketspace. This will bring economic influx to the local community and provide residents with a space to enjoy. Eliminating the stress of affording food for the local community will give Sharswood residents one less challenge to face.

Architecture

We will transform and integrate unused buildings for the benefit of the community, as well as maximize agricultural food production, retail space, energy production and recreational areas. All of this will be accomplished while developing a stronger connection between the natural environment and the local community. The architectural language will be utilitarian, but provide the "scaffolding" for community customization and expression, not only via the aforementioned murals, but also through materiality and use of local community retail. The building on the southwest corner of the site will remain the existing vehicular mechanical shop. The building just above the garage is the retail building with flexible kiosks for any merchant to fill. The townhouse to the east side of the retail building will operate as a community kitchen (was previously a pizza shop) and the second and third floors will remain as residences to the current tenants. The two buildings to the east of the community kitchen will be NPPP's educational building that includes a multipurpose room, co-working library, offices as well as classroom spaces. Finally, the building that rests on the far east edge of the block will act as a multipurpose building with classroom spaces as well as rentable private offices for small business startups.

Engineering

As mentioned above, we will be implementing a scaffolding structure that will be engineered and modified to be a permanent structure, despite its highly cost-effective nature. The roofs of the scaffolding and the existing buildings will be the substrate for additional food production, water collection, and energy generation, with the help and expansion of utility by the scaffolding system, which will also increase navigability of the site by visitors and users of all

mobility levels. Licensed professional MEP and structural engineers will advise as we continue to engineer the project. The building envelope of the retail and garage buildings consists of CMU structure with biofiber insulation. The remaining buildings consist of a brick structure and biofiber insulation. We are capturing roof runoff to be housed within our cisterns located on the roof of (Will add number of cisterns and sizing) The water collected in the cisterns Using it as irrigation, Placing the cisterns on the roof will allow us to use gravity to distribute the water from the cistern to the system in the buildings. The stormwater runoff is managed in the basin. The total site area consists of 38,000 S.F. The total infiltration goal is 25,414 S.F. and the total roof capture is 13,036 S.F. The bio fiber insulation and the structure of the buildings enhance the acoustical design of the project. They muffle the sounds that might occur outside. We are using Covert LED-x 500 watt full-Spectrum LED Grow Light for the green wallstreet scaffolding system The interior lighting fixtures are LED light (will spec).

Market Analysis

We plan to preserve the existing Market (CMX-2) , Mechanic shop (CMX-2) , Pizza shop (RM-1), and the three row homes (RM-1). This is important to us because Sharswood is currently being gentrified, as that development creeps in from nearby areas including the Temple Town and Brewerytown. Typical developers seldom plan to revitalize the existing structures but instead demolish and begin with a blank canvas. The typical home value of homes in Sharswood is $225,612. Sharswood home values have gone up 11.7% over the past year and they are predicted to rise an additional 9.2% in the next year.

Durability and Resilience

The existing buildings are made primarily of brick and CMU. These building materials will last a lot longer than what a traditional developer in this area would use (stick frame), as long as roof and wall integrity can be maintained. The structural lattice-work we are providing via the scaffolding will create an additional protective layer around these surfaces, extending their lifespan and making maintenance much easier and less expensive.

Business Model

Phase 1 of The NPPP's Business model consists of calculating the total operating expenses needed to fund the addition of the Green Wallstreet scaffolding system. The total start up cost is $2,758. The start up costs consists of the scaffolding, seed, growth medium, and harvesting equipment. The total initial investment is $2,758 and the operating income is $.

Phase 2 of The NPPP's Business model consists of enclosing the scaffolding with polyethylene sheets and installing two Covert LED-x 500 watt full-Spectrum LED Grow Light. Phase 2 would cost approximately $. All energy required by the LED Grow Lights will be powered by the energy harvested by the solar panels.

Embodied Environmental Impact

We will strive to lower our embodied environmental impact by restoring and repurposing existing buildings and/or materials on site. By giving preference to local materials and local labor we will be helping the community and the environment as a whole. The community will be directly involved in the construction process. Our ultimate environmental goal is to maximize rainwater collection, solar energy and potentially wind energy production.

Integrated Performance

The scaffolding based space frame structure is designed with the purpose of creating space for not only farming, but also photovoltaics, wind turbines and water collection. Elevating these systems will maximize their performance as the PV and wind turbines will get more exposure to sun and wind, as rainwater gets collected from the rooftops and stored in a rooftop cistern.

Comfort and Environmental Quality

Our proposal will give the community a safe space to interact with each other, resulting in a stronger community alliance. Community members will develop a stronger connection to the natural environment, by implementing and maximizing the cultivation and growth of vegetation within our buildings. Incorporating the use of natural materials such as wood and harvesting food indoors will bring an overall “organic” feel to the user. Implementing operable structures that open to the outdoors when weather permits will allow our building to directly respond to the experiential environmental qualities the site has to offer. We will bring man and nature closer together by maximizing natural light and natural ventilation whenever possible.

Occupant Experience

The site is programmed to include several activity types such as outdoor agriculture, arts and design classes, a library filled with history and sustainability books, a community run kitchen, and an indoor flexible market. The interior design is a mix of Afro-Futurism aesthetics as a well as modern utility. The appliances in the buildings consist of refrigerators, toilets, sinks, bathtubs, and a full commercial kitchen setup. Allowing all of the interior spaces to be flexible -besides the kitchen- the community is at liberty to use the buildings to suit their current needs while being able to adapt for the future.

Energy Performance

Photovoltaics and wind turbines will be the main source of energy to the entire block and sell the excess back to the grid. The collection and storage of rainwater on site will provide for irrigation systems and the needs of the block, along with on-site agricultural growing, the intention is for the site to become self-sufficient.

Presentation

The team will develop documents that inform both community stakeholders and DOE competition judges.

Technical Specifications

Wall Assemblies: North, South, East, and West Facades: R-37

Foundation Insulation: R-28

Roof insulation: R-52 w/ staggered insulation + drainage board

Window Performance: U 0.9 - 1, Triple glazed, fixed & operable

Energy Star Baseline (EUI)

- Retail store = 103.5
- Food sales and service (restaurant) = 325.6
- Education = 52.4
- Office = 52.9

Target EUI before renewables: 20 BTU (all zones combined)

- Retail store (Mechanic shop) = below 20
- Food sales and service (restaurant) = below 100
- Education = below 20
- Office = below 20

HVAC Strategy: VRF with ERV centralized system for all of the west side buildings on site + Passive Ventilation with heat recovery from the kitchen exhaust and greywater . Also working on a combined system that will move warmth and cool air from building to building, reducing the EUI. For the building that sits on the eastside of the block, we will create a VRF mini split system.

- System Cooling setpoints:
  - Main Setpoint = 23.9 ‘C
  - Setback - 26.7 ‘C
- System Heating setpoints:
  - Main Setpoint = 20.6 ‘C
  - Setback - 15.6 ‘C

Renewables: PV panels have been acquired by the North Philly Peace Park and brought on site + additional panels as needed. Possible wind turbines (currently looking into wind energy)

There are 144 Solar Panels distributed on the site, able to produce up to 130 kWh/ft2, which will be enough to satisfy the site’s needs and sell energy back to the grid.

ENERGY PERFORMANCE

1. Utilizing roof-tops to optimize solar radiation and maximize both growing area and energy production.
2. Used solar panels brought to site + any additional PV needed will be the main source of energy production to the entire block, with the intention of selling any excess back to the grid.
3. The collection and storage of rainwater on site will provide for irrigation systems and the needs of the block, along with on-site agricultural growing, the intention is for the site to become self-sufficient.
4. Seek energy efficient mechanical systems; specifically mini split heat pump + ERV on each building. We are also looking at ways to move warmth and coolth from building to building with the goal to further reduce the EUI.

1. Describe the neighborhood and/or community setting, including density, access to, and reliance on various transportation modes

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2. **Summarize the lot location, size, shape, orientation, and relationship to road(s) + Summarize the intended occupants and their characteristics + Describe how the building's community setting, lot location, and occupant characteristics impact the design constraints**

There are multiple different intended uses of the interior spaces based on the Integrated Community Supply-Chain Retail Model. Split up between agricultural, educational, and creative spaces, the occupants will be able to learn how to produce goods on the site in order to supply for the retail building. Most of these areas can be considered "Incubation Zones" that will act as a test bed and start up for small local businesses in order to boost the local economy. The full supply-chain of agricultural products on the site ranges from seed planting to growing, processing, selling, cooking and eating the grown food - all surrounded with an educational component as guidance for every step in the agricultural process to encourage community growth. Other maker-space areas will be spotted throughout the site for creative development in the community. This diagram shows the possible future programming of the site and their occupancy requirements.

3. **Describe the local climate** (All diagrams will be moved to a bottom page of unreadable diagrams)

Climate zone 4A defined by ASHRAE169-2006
This climate features warm summers with high humidity, and cold dry winters.

- The rain and clouds come regularly with more precipitation in the fall and winter months.
- Cloud coverage creates irregularities in solar power throughout the year with upwards of 7kWh/sf in the peak summer months, but dips down well into ~2kWh/sf nearer to the winter months of Dec and Jan.
- The average wind speed in Philadelphia is around 20mph and comes from different directions depending on the season. Philadelphia is also subject to tropical storms, hurricanes, and nor'easters all of which can bring high winds and varied amounts of water.
- These forces create flooding and overflow in the combined sewers, and cause human waste to be redirected to major local waterways.

4. **Describe how existing codes, standards, and programs influence the building's design and achieve competition goals"Variance for the programmatic use of agriculture, what are the requirements?"**

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5. **Summarize the goals the team considered when creating and developing the design.**

The North Philly Peace Park's goals include working with community members to revolutionize a bigger system and change the lives of the city and to create an ecology center, a system for urban farming, advancing social and environmental resilience through the design of modular scaffolding structures relying on growth systems and solar/ water harvesting.

6. **Summarize the building systems anticipated for the design.**

The building systems anticipated for the design of North Philly Peace Park include, Solar harvesting with the use of solar panels, Water harvesting with the use of green roofs and cisterns. The modular scaffolding structures include growth systems and solar/ water harvesting.